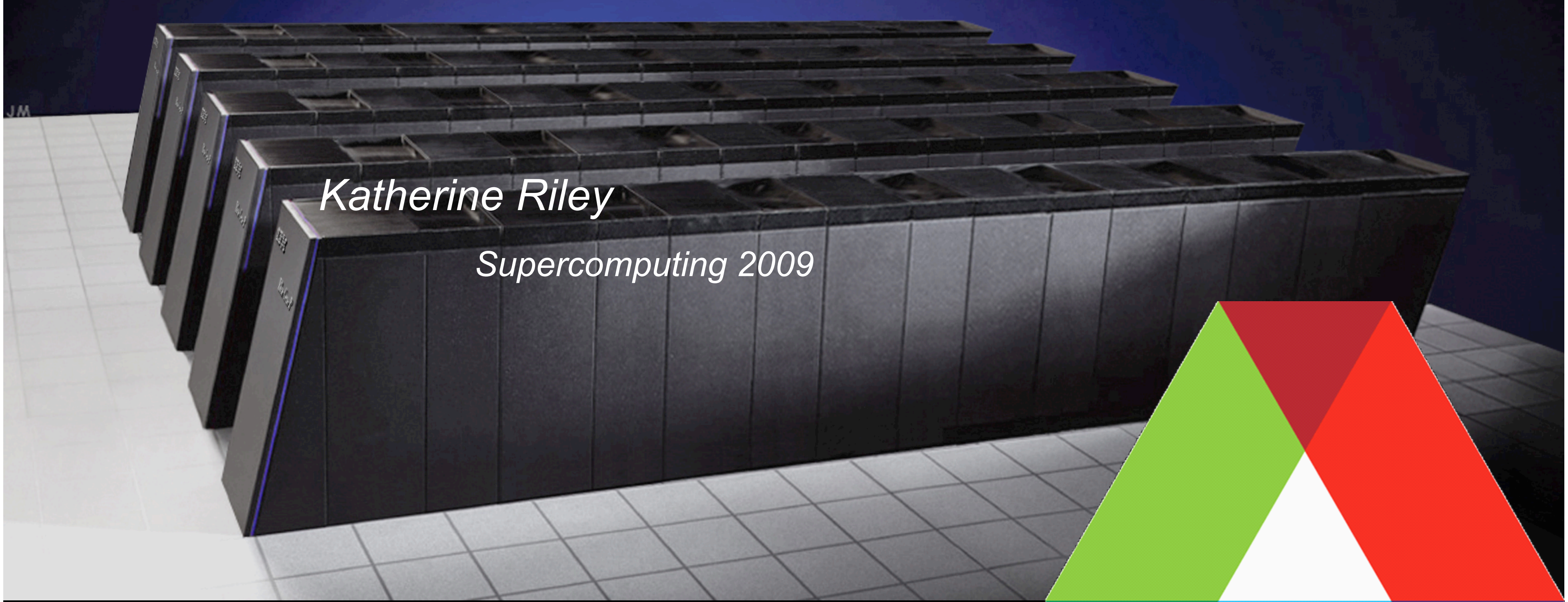
Argonne
NATIONAL LABORATORY

ALCF-2 Early Science Program



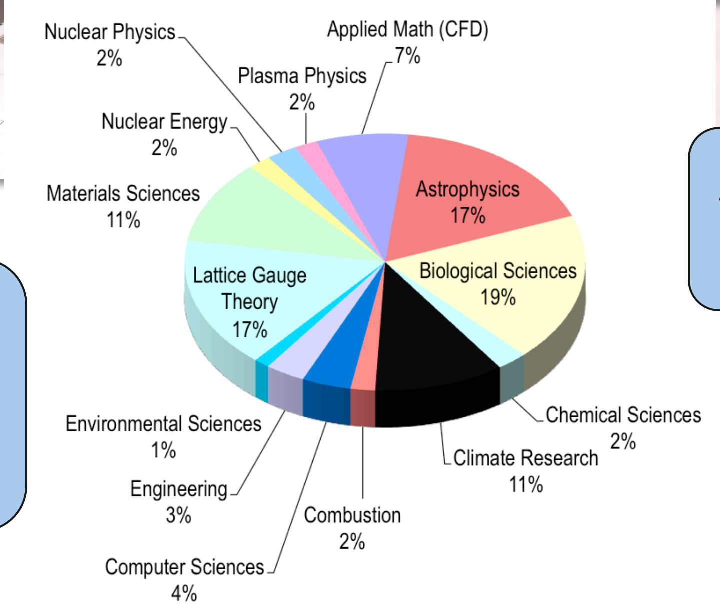
Katherine Riley

Supercomputing 2009

Background on ALCF-1

- 556-teraflops
  IBM Blue Gene/P

WORLD'S FASTEST OPEN SCIENCE SUPERCOMPUTER
ALCF
ARGONNE LEADERSHIP COMPUTING FACILITY
JUNE 2008 • SOURCE: 31ST TOP500



2009 INCITE Allocations

28 projects

400 M CPU-Hours

2010 INCITE Allocations

656 M CPU-Hours

U.S. DEPARTMENT OF ENERGY
INCITE
LEADERSHIP COMPUTING

ALCF-2 Early Science

In early 2012 the ALCF will be installing at least 10PF of a next generation Blue Gene. We are asking the community to help us make this deployment as successful and productive as possible.

What is Early Science?

- *Shake-out the system and software stack using real applications*
- *Develop community and ALCF expertise on the system*

Goals of ALCF-2 Early Science Program

- A stable and well documented system moving into production
- *Exemplar applications over a broad range of fields*
- *At least 2 billion core-hours to science*

Next Generation Blue Gene

Nodes

- Higher levels of HW parallelism
- Applications expecting approximately 10x performance/node
- Twice the memory/core

Primary Focus

Exploiting the increased per-node parallelism

Interconnect

- Continuing the Blue Gene tradition of a very strong interconnect

I/O

- Optimizing the end-to-end I/O software stack
- Targeting 240 GB/s aggregate peak BW

Full machine detail from NDA with IBM

Participation in the Program

Benefits

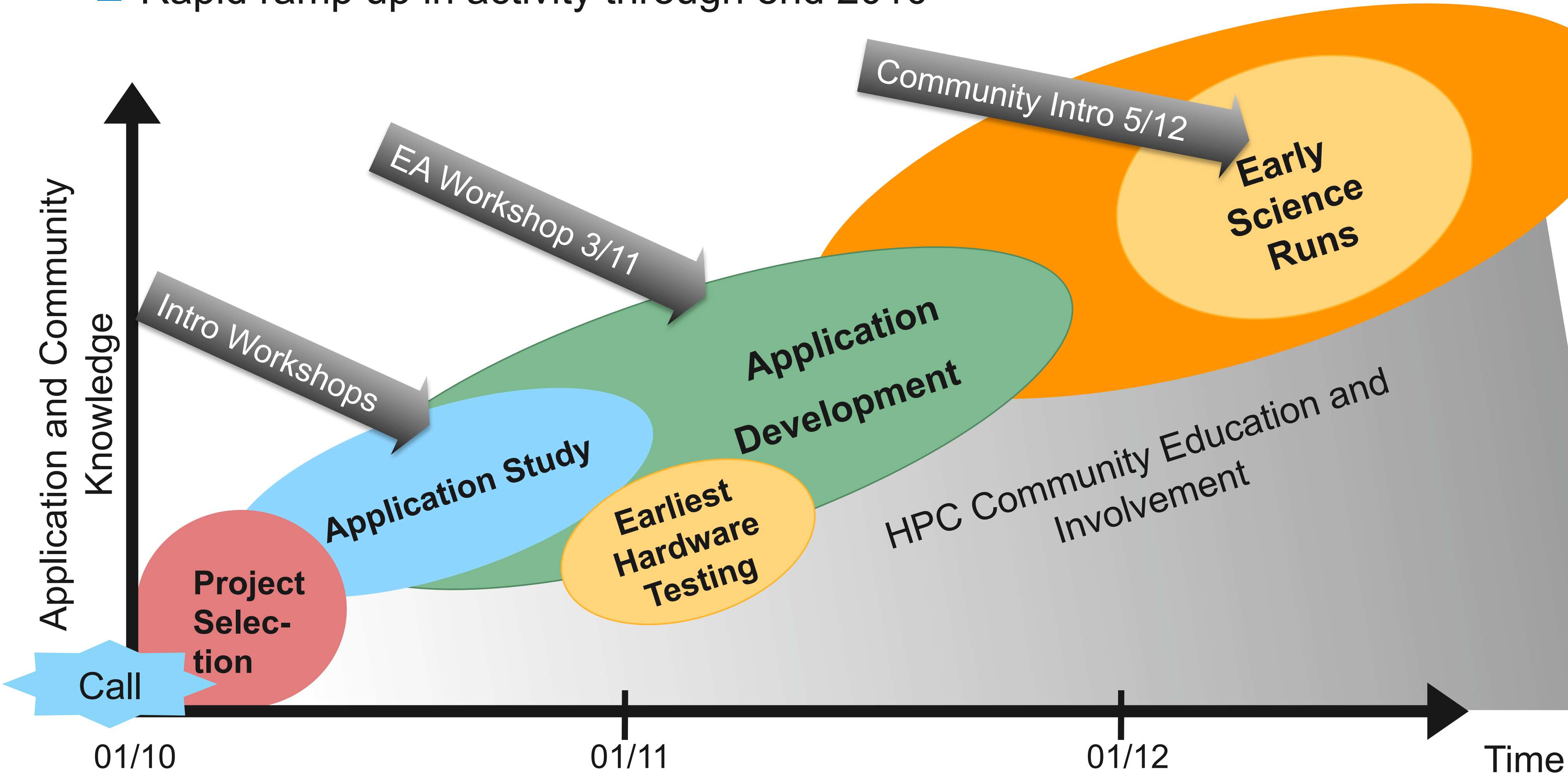
- Dedicated time of an LCF staff member
- LCF post-doc devoted to project
- Jump start with new hardware
- Access to significant compute resources for science

Expectations

- High impact science
- Commitment of *project* staff to work with ALCF-2
- Pursue NDA with IBM
- Work with ALCF-2
  - Identifying problems and diagnosing
  - documenting and reporting progress

Timeline

- Opening the call in January 2010 due March 31, 2010
- Rapid ramp up in activity through end 2010



Proposal Requirements

- Science problem and the impact
- Target application and its current capabilities
- Development requirements
  - Science
  - Code
  - Expected challenge of tasks
- Best estimates for compute resources needed for science and development work
- Current funding sources and expected funding over the next 2 years

- *A length of approximately 6 pages*
- *ALCF might contact applications for further information*

Two Key Dates Right Now

Call for Proposals

January 2010

Proposals Due

March 31, 2010

- In the next few weeks the website will be going up
  - http://esp.alcf.anl.gov
- In the meantime: riley@alcf.anl.gov